

NOTES ON AUSTRALIAN MOSQUITOES (DIPTERA, CULICIDAE).

VI. FIVE NEW VICTORIAN SPECIES AND A DESCRIPTION OF THE LARVA OF
AÈDES MILSONI (TAYLOR).

By N. V. DOBROTWORSKY, Zoology Department, University of Melbourne.*

(Five Text-figures.)

[Read 24th October, 1962.]

Synopsis.

Adults, larvae and pupae of *Culiseta antipodea*, n. sp., *Aedes imperfectus*, n. sp., and *Aedes subbasalis*, n. sp., are described and figured. *C. antipodea* is placed in the subgenus *Climacura*; the other species of this subgenus is distributed in the Eastern and Central United States. *Aë. imperfectus* is closely related to *Aë. burpengaryensis* (Theobald), and *Aë. subbasalis* to *Aë. rupestris* Dobrotworsky. Descriptions are given of the adults of *Masonia variegata*, n. sp., the female of *Masonia aurata*, n. sp., and the larva of *Aedes milsoni* (Taylor).

CULISETA (CLIMACURA) ANTIPODEA, n. sp.†

Types: The holotype, allotype and seven paratypes were bred from larvae collected by the author 23.1.62 at Cann River, Victoria; 13 paratypes were bred from larvae collected by G. W. Douglas 15.9.54 at Wilson's Promontory and from an egg raft collected 5.3.54 at the same locality. The holotype, allotype and 10 paratypes have their associated larval and pupal skins. The holotype male, allotype female, five paratype males and five paratype females are in the collections of the National Museum, Melbourne. One paratype male and one paratype female are in each of the following collections: C.S.I.R.O., Division of Entomology, Canberra; School of Public Health and Tropical Medicine, Sydney; University of Queensland, Brisbane; British Museum (Natural History), London; U.S. National Museum, Washington.

Material Examined: 30 ♂♂, 25 ♀♀.

Distinctive Characters: Adult: Forked upright scales on vertex black. Scutum, tergites and sternites black scaled. Tarsi black. Male terminalia: Coxite with black setae; basal lobe small with 2-3 strong setae and several finer ones. Phallosome smooth. Larva: Brown. Siphon with ventral row of setae. Lateral comb composed of single row of scales.

Holotype Male. Head: Vertex clothed with narrow curved pale scales and black forked scales. Proboscis black scaled. Palps about as long as proboscis with labella, black scaled; terminal segment not swollen. Antennae plumose, hairs of verticils evenly spread round the segments. Thorax: Integument dark brown. Scutum sparsely clothed with narrow curved dark-bronze and black scales. Scutal bristles black. Scutellum with a few narrow dark scales. Posterior pronotum with a few hair-like scales. One small black spiracular bristle. Sternopleuron with a few black bristles. One lower mesepimeral bristle and 2-3 narrow pale scales towards middle. Wing length: 2.7 mm. Legs: Black scaled, femora pale below. Fore and mid claws toothed, hind simple. Abdomen: Tergites and sternites black scaled; scales on VIIIth sternite paler. Terminalia (Fig. 1, a): Coxite about three times as long as broad, with black bristles. Basal lobe about one-fifth of length of coxite, with 2-3 long strong setae and several finer ones at tip. Style narrow, slightly less than half length of coxite, with three minute setae spaced along it and three at tip. Terminal appendage small. Paraproct with three strong teeth. Phallosome simple, smooth. Lobes of IXth tergite flat, each with 5-6 setae.

* This work was supported in part by a grant from the Trustees of the Science and Industry Endowment Fund of the Commonwealth Scientific and Industrial Research Organization.

† The generic name *Theobaldia* Neven-Lemaire being preoccupied by *Theobaldia* Fischer, 1885. Mosquitoes of the genus are now renamed to *Culiseta* Felt.

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Allotype Female. This differs from the holotype as follows: Palps about one-fifth length of proboscis. Scutal scales narrow, curved, black. There are more narrow curved scales on posterior pronotum. Three lower mesepimeral bristles and patch of pale hairs towards middle. Wing length: 3.8 mm. All tarsal claws simple.

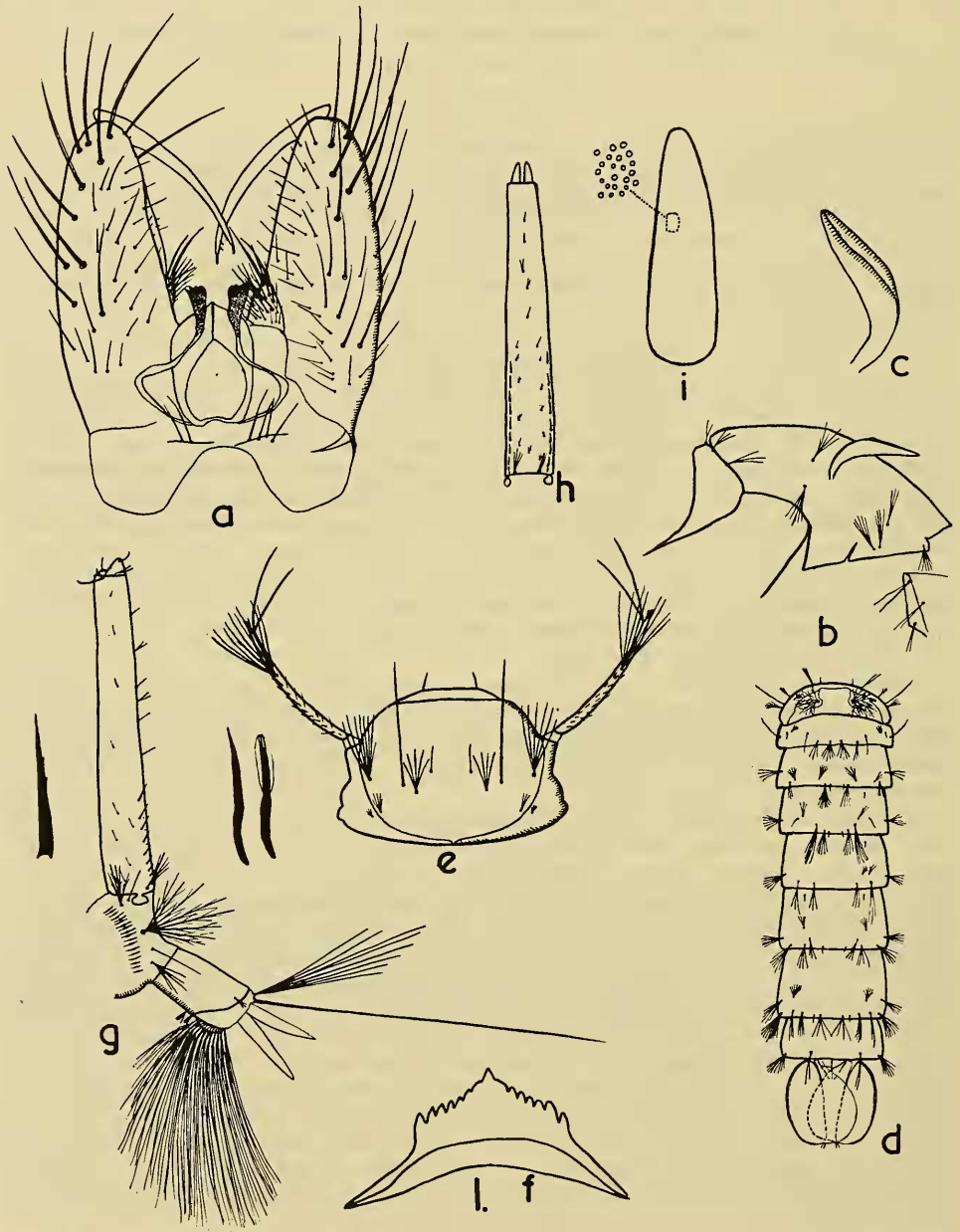


Fig. 1. *Culiseta antipodea*, n. sp. a, ♂ terminalia, left coxite sternal aspect, right tergal aspect; b, c, pupa; b, cephalothorax and metanotum; c, trumpet; d, abdomen; e, f, g, h, larva; e, head; f, mentum; g, terminal segments; i, eggs.

Paratype Males and Females. The series of 10 paratype males and 10 paratype females do not show significant variations. Wing length in males varies from 2.8 mm. to 3.7 mm., in females from 3.3 mm. to 3.6 mm. There are from 1 to 3 spiracular

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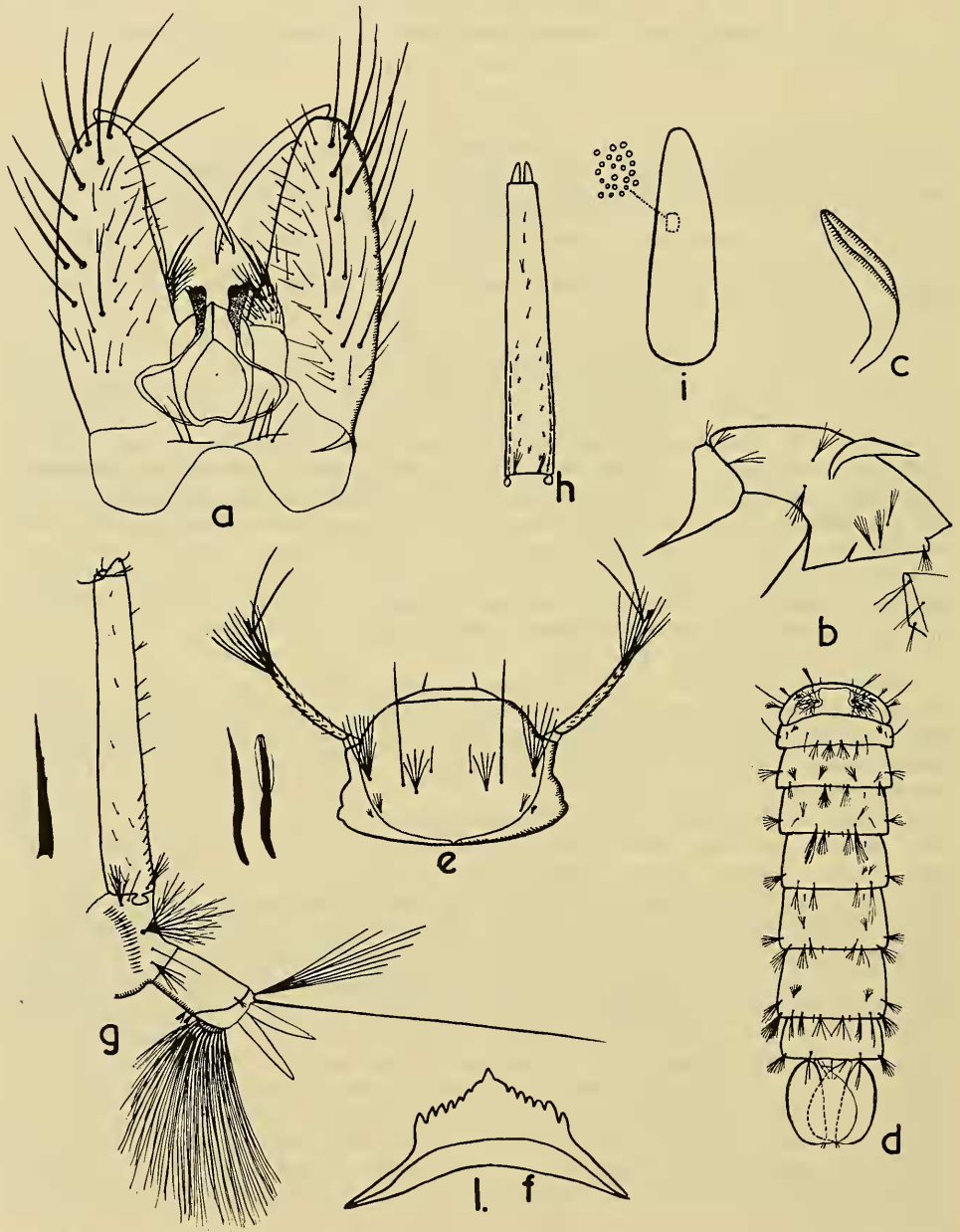


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bristles and from 1 to 3 lower mesepimeral bristles. Some females have a few narrow pale scales among pale hairs of mesepimeron towards the middle.

Pupa: Details shown in Figure 1, *b*, *c*, *d*.

Larva (Fig. 1, *e*, *f*, *g*, *h*): Brown. Head broad. Head setae 4 and 6, single; 5, 4-5 branched, about $\frac{1}{4}$ length of seta 6; 7, 6-8 branched; 8, 3-5 branched; 9, 4-6 branched. Antenna long, curved, about as long as head; seta 1 with about 30 branches. Mentum with broad central tooth and 6-7 lateral teeth on each side. Thorax: Prothoracic setae 1, 2, 4 and 6, single; 3, 2 branched; 4, 4-7 branched. Abdomen: VIIIth segment: Lateral comb of 14-21 scales in single row. Seta 1, 5-9 branched; 2 and 4, single; 3, 6-9 branched; 5, 4-5 branched. Syphon long, slightly tapering, index 6.1-7.5, mean 6.8. Pecten of 6-9 spines. Basal siphonal seta, small, 3-5 branched; 7-8 minute lateral setae along siphon; 10-12 minute setae on ventral side between pecten, and row of 5-6 single or two branched, longer, fine setae in single row above pecten. Anal segment: Saddle complete ring; seta 1, small, 3-4 branched; 2, 6-10 branched; 3, single; 4 (ventral brush) of 14 tufts. Anal papillae narrow, pointed, about as long as saddle.

Eggs (Fig. 1, *i*): An egg raft found in a Teatree swamp at Wilson's Promontory, Victoria, by Mr. G. W. Douglas 5.3.54 consisted of 102 eggs. Several adults were reared from it.

Biology: In Queensland it breeds in Teatree swamps and semi-permanent pools 2-3 feet deep, in coastal heath country (E. N. Marks). In Victoria also it was found breeding in Teatree swamps with a dense growth of tall *Gleichenia dicarpa*, *Cladium tetragonum* and *Restio tetraphyllus*. In the swamp near Cann River the vegetation was so dense and entangled that movement through it was possible only by following animal tracks. There the larvae of *C. antipodea* were associated with larvae of *C. fergusonii* (Taylor), *C. orbstiensis* Dobr., *C. inconspicua* (Lee) and *A. atratipes* Skuse. Adults have not been collected in the field.

Biting Habits: *C. antipodea* does not attack man and nothing is yet known about the blood sources of this species.

Distribution: *C. antipodea* was found breeding in Queensland: Caloundra 13.VIII.45, F. A. Perkins & J. L. Wassell; Victoria: Wilson's Promontory 5.III.54, 15.IX.54, G. W. Douglas; Cann River 23.I.62, 20.III.62, N. V. Dobrotworsky.

Discussion: Within the genus *Culiseta*, recognition of subgenera on adult characters is notoriously difficult. Edwards (1932), with only adult specimens available, placed the four Australian species known at the time in the subgenus *Climacura*, but on larval characters (Dobrotworsky, 1954, 1960) three of these species have since been placed in other subgenera.

The subgenus *Climacura* is characterized by the row of ventral tufts along the siphon and by the arrangement of the lateral comb scales in a single row. These features are found in only two species: the North American *C. melanura* (Coquillett), for which the subgenus was established, and the present species *C. antipodea*. The two are remarkably similar. In the adults of both, the antennae are of the *Culex* type and the palps of *Aedes* type and with the terminal segment not swollen. The male terminalia show little difference.

As far as the larvae are concerned there is a strict correspondence in the setae of the head of the two species and in the structure of the terminal segments of the abdomen.

The similarity of these species becomes more remarkable when it is realized that the subgenus is not known from any parts of the world other than North America, New Zealand and Australia.

MANSONIA VARIEGATA, n. sp.

Types: The type series was collected at Cann River, Victoria. Holotype male 23.I.62; allotype and two paratype females 6.II.61. The holotype and allotype are in the collections of the National Museum, Melbourne. One paratype female is in the collections of C.S.I.R.O., Division of Entomology, Canberra, and the second in the University of Queensland, Brisbane.

Material Examined: 1 ♂, 3 ♀♀.

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Material Examined: 1 ♂, 3 ♀♀.

Distinctive Characters: Proboscis more or less mottled. Wing with broad scales, mottled. Femora and tibiae mottled; hind femora and tibiae with preapical creamy patch. Tarsi with apical creamy bands.

Holotype Male. Head: Vertex with narrow curved pale scales; upright scales pale medially, black laterally and towards neck. Palps exceed length of proboscis with labella, by terminal segment. Proboscis black, slightly mottled with pale scales. Thorax: Integument dark brown with some lighter areas on pleura. Scutum clothed with narrow curved light-golden and black scales; front and lateral margins have more light-golden scales than black. Scutellum with narrow curved light-golden scales and darker border bristles. Posterior pronotum with narrow curved light-golden scales. Pleura with two patches of broad scales on sternopleura. Lower mesepimeral bristles

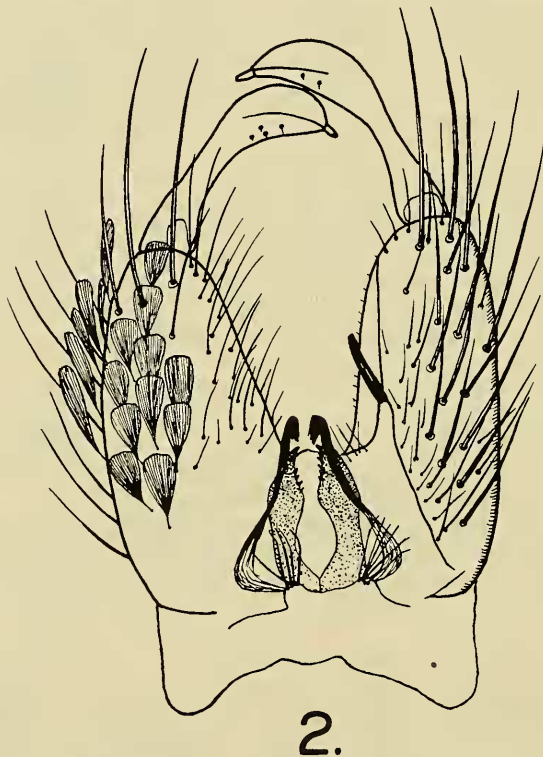


Fig. 2. *Mansonia variegata*, n. sp. ♂ terminalia, left coxite sternal aspect, right tergal aspect.

absent. Wing mottled, scales broad. Wing length 3.7 mm. Knob of halteres pale scaled. Legs: Femora and tibiae mottled, with preapical patch of pale scales most conspicuous on hind legs. Knee spots white. First three tarsal segments of fore and mid legs with creamy apical bands. Hind tarsi with four apical bands. Fore and mid tarsal claws toothed, hind claws simple. Abdomen: Tergites black scaled with white basal lateral patches. Sternites white, with large triangular black patch toward apical border. Terminalia (Fig. 2): Coxite slightly more than twice as long as broad; sternally and laterally with broad scales, tergally and laterally with long setae. Basal lobe with long blunt spine. Style swollen distally, with small appendage. Paraproct with four strong teeth. Phallosome scoop-shaped with thickened margins and teeth along each side. Lobes of IXth tergite small, with five setae.

Allotype Female. This differs from the holotype as follows: Proboscis creamy scaled, except for black-scaled base and tip. Palps about one-quarter length of proboscis, black scaled, with a few white scales dorsally. Pleura with distinct dark

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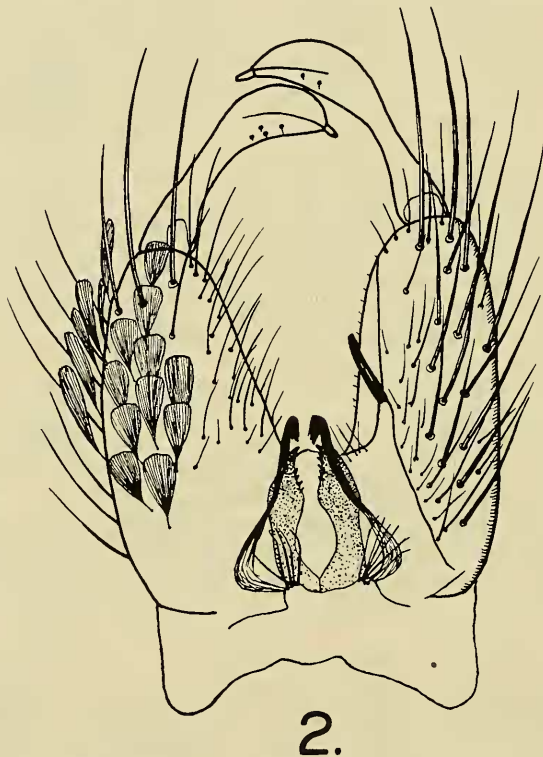


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band extending from upper part of mesepimeron to posterior pronotum. Two strong lower mesepimeral bristles. Wing length 3.6 mm. Upper fork cell slightly longer than stem. All claws simple. Eighth tergite with pale scales. Sternites black, with small lateral patches of white scales.

Paratype Females. The two paratype females are similar to the allotype. Wing length 3.6 mm.

Biology and Habits: Mating has been observed just after sunset; it is initiated in flight, and completed on grass. It is a man-biting species. All specimens were collected, after sunset, near a permanent Teatree swamp.

Distribution: *M. variegata* is known only from the type locality, Cann River, Victoria, 6.II.61 and 23.I.62, N. V. Dobrotworsky.

Discussion: The holotype male and one paratype female have one spiracular bristle, which are absent in all other species of the genus.

It is difficult to assign *M. variegata* to any one of the subgenera recognized by Edwards (1932). On the characters of the male terminalia and palps, seventh abdominal segment of the female which is large, and the absence of post-spiracular bristles it appears to belong to *Coquillettidia*, but the wing scales are broad, not "rather narrow (lanceolate to almost linear)", as is characteristic of this subgenus. It is better not to assign this species to a subgenus until the larva is discovered.

MANSONIA AURATA, n. sp.

Types: The type series was collected at Cabbage Tree Creek, Victoria. Holotype female and 10 paratype females, 16.XII.59. The holotype and five paratypes are in the collections of National Museum, Melbourne. One paratype is in each of the following collections: C.S.I.R.O., Division of Entomology, Canberra; School of Public Health and Tropical Medicine, Sydney; University of Queensland, Brisbane; British Museum (Natural History), London; U.S. National Museum, Washington.

Material Examined: 46 ♀♀.

Distinctive Characters. Proboscis black. Scutum uniformly clothed with light-golden scales. Wing with narrow dark scales. Hind tibia black. Tarsi with basal creamy bands. Tergites black, unbanded; sternites pale with a few dark scales.

Holotype Female. Head: Vertex with narrow curved light-golden scales and upright light-golden scales, becoming black laterally. Proboscis black. Palps dark, with some pale scales dorsally. Thorax: Integument brown; scutum with light-golden scales; most bristles black. Posterior pronotum with narrow curved light-golden scales. Scutellum with narrow scales. Post-spiracular area with patch of elongate pale scales. Sternopleura and mesepimeron with patches of broad pale scales and light-golden bristles; three lower mesepimeral bristles. Wing length: 4.0 mm. Wing with narrow dark scales with violet-pink reflections. Upper fork cell about twice length of its stem. Knob of halteres dark, pale scaled. Legs: Fore and mid femora dark scaled with admixture of pale scales above, pale scaled below. Hind femora pale except for dark tip on distal quarter, extending toward base dorsally. Knee spots light-golden. Fore and mid tibiae dark above, pale below; hind tibiae black, with violet reflections. First segment of all tarsi creamy below for about half length. Fore tarsi with two basal creamy bands, mid and hind with four. All claws simple. Abdomen: Tergites black scaled, with violet reflections, unbanded; basal lateral spots creamy. Sternites pale scaled, with a few dark scales medially.

Paratype Females. The series of ten paratypes does not show much variation. In some specimens the number of dark scales on sternites is increased and they then form an inconspicuous band towards the apical border. Wing length varies from 3.5 mm. to 4.2 mm.

Biting Habits: A day biting species which attacks man.

Distribution: *M. aurata* has been collected in east Gippsland, Victoria, east of Orbost. Specimens have been examined from the following localities: Cabbage Tree Creek, 5.XII.57, 16.XII.59, 7.II.61, 22.I.62; Cann River, 6.II.61, 22.I.62; Genoa, 7.II.61, N. V. Dobrotworsky.

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Material Examined: 46 ♀♀.

Distinctive Characters. Proboscis black. Scutum uniformly clothed with light-golden scales. Wing with narrow dark scales. Hind tibia black. Tarsi with basal creamy bands. Tergites black, unbanded; sternites pale with a few dark scales.

Holotype Female. Head: Vertex with narrow curved light-golden scales and upright light-golden scales, becoming black laterally. Proboscis black. Palps dark, with some pale scales dorsally. Thorax: Integument brown; scutum with light-golden scales; most bristles black. Posterior pronotum with narrow curved light-golden scales. Scutellum with narrow scales. Post-spiracular area with patch of elongate pale scales. Sternopleura and mesepimeron with patches of broad pale scales and light-golden bristles; three lower mesepimeral bristles. Wing length: 4.0 mm. Wing with narrow dark scales with violet-pink reflections. Upper fork cell about twice length of its stem. Knob of halteres dark, pale scaled. Legs: Fore and mid femora dark scaled with admixture of pale scales above, pale scaled below. Hind femora pale except for dark tip on distal quarter, extending toward base dorsally. Knee spots light-golden. Fore and mid tibiae dark above, pale below; hind tibiae black, with violet reflections. First segment of all tarsi creamy below for about half length. Fore tarsi with two basal creamy bands, mid and hind with four. All claws simple. Abdomen: Tergites black scaled, with violet reflections, unbanded; basal lateral spots creamy. Sternites pale scaled, with a few dark scales medially.

Paratype Females. The series of ten paratypes does not show much variation. In some specimens the number of dark scales on sternites is increased and they then form an inconspicuous band towards the apical border. Wing length varies from 3.5 mm. to 4.2 mm.

Biting Habits: A day biting species which attacks man.

Distribution: *M. aurata* has been collected in east Gippsland, Victoria, east of Orbost. Specimens have been examined from the following localities: Cabbage Tree Creek, 5.XII.57, 16.XII.59, 7.II.61, 22.I.62; Cann River, 6.II.61, 22.I.62; Genoa, 7.II.61, N. V. Dobrotworsky.

Discussion: *M. aurata* has no post-spiracular bristles and has narrow wing scales. On these characters it appears to be *Coquillettia*, but should not be assigned to this subgenus until the male is discovered.

AËDES (OCHLEROTATUS) IMPERFECTUS, n. sp.

Types: The type series was bred from larvae and pupae collected at Woori Yallock, Victoria, 16.IX.58. Holotype, allotype, two paratype males and four paratype females have their associated larval and pupal skins. The holotype male, allotype female, five paratype males and five paratype females are in the collections of the National Museum, Melbourne. One paratype male and one paratype female are in each of the following collections: C.S.I.R.O., Division of Entomology, Canberra; School of Public Health and Tropical Medicine, Sydney; University of Queensland, Brisbane; British Museum (Natural History), London; U.S. National Museum, Washington.

Material Examined: 15 ♂♂, 102 ♀♀.

Distinctive Characters. Adult: Scutum light-golden, with two dorso-central black stripes. Hind femora in females, white with black scales at tip making a ring, broken below. Tergites usually unbanded, with large lateral patches of creamy scales extending to dorsal side. Larva: Only first stage larvae have detached pecten teeth beyond seta 1. Fourth stage larva: Head setae 5 and 6 single. Lateral comb of 10-14 spines arranged in single row.

Holotype Male. Head: Vertex with narrow curved and upright scales creamy. Proboscis and palps dark scaled. Palps longer than proboscis without labella by about length of terminal segment. Thorax: Integument black. Scutum clothed with light-golden scales becoming paler around bare area. Posterior pronotum with narrow curved creamy scales. Pleura with patches of broad creamy scales and bristles. No lower mesepimeral bristles. Wings dark scaled; wing length: 4.6 mm. Knob of halteres dark with white scales. Legs: Fore and mid femora black anteriorly, pale posteriorly, unmottled. Hind femora white on basal three-quarters, black dorsally with dark dorsal line on apical half. Tibiae and tarsi black with dull violet reflections. Fore and mid claws toothed; hind claws simple. Abdomen: Tergites black scaled with violet reflections; basal lateral patches large, creamy. Sternites pale scaled with apical black bands and some black scales medially. Terminalia (Fig. 3, a, b): Coxite with short setae tergally and a few long setae laterally and apically. Sternally coxite with scales and long and medium setae. Basal and apical lobes small. Basal lobe with large patch of short, fine setae and one long seta near tergal edge. Apical lobe pointed, with one long curved, flattened seta and a few shorter ones at base. Style widening in middle; on apical third more slender and with four small setae; appendage long. Harpago long, with pilose subbasal thumb on inner side, bearing terminal seta about as long as thumb. Appendage with curved pointed tip and fimbriated distal margin. Paraproct with single tooth. Lobes of IXth tergite with 7-8 stout setae.

Paratype Males. The series of ten paratype males does not show much variation. Wing length varies from 3.4 mm. to 4.3 mm. Sternites in some specimens have more black scales medially and these may join the apical black band forming triangle.

Allotype Female. This differs from the holotype male as follows: Palps about one-fifth of proboscis with labella. Four lower mesepimeral bristles. Wing length: 5.0 mm. Upper fork cell is less than twice its stem. Hind femora white with black scales dorsally and laterally on distal quarter and forming a dorsal line for three-quarters of length. All hind claws except one toothed. First tergite with some white scales; second to sixth with line of pale scales at base and large lateral triangular spots of creamy scales. Seventh tergite mostly pale scaled. Sternites white scaled, becoming creamy towards apical border.

Paratype Females. The series of ten paratype females does not show much variation. The number of lower mesepimeral bristles varies from two to five. Wing length from 3.3 mm. to 5.0 mm. On the hind femora the area covered by dark scales may be reduced to a dorsal line on the distal half, broadening toward the tip. Hind claws in

Discussion: *M. aurata* has no post-spiracular bristles and has narrow wing scales. On these characters it appears to be *Coquillettia*, but should not be assigned to this subgenus until the male is discovered.

AËDES (OCHLEROTATUS) IMPERFECTUS, n. sp.

Types: The type series was bred from larvae and pupae collected at Woori Yallock, Victoria, 16.IX.58. Holotype, allotype, two paratype males and four paratype females have their associated larval and pupal skins. The holotype male, allotype female, five paratype males and five paratype females are in the collections of the National Museum, Melbourne. One paratype male and one paratype female are in each of the following collections: C.S.I.R.O., Division of Entomology, Canberra; School of Public Health and Tropical Medicine, Sydney; University of Queensland, Brisbane; British Museum (Natural History), London; U.S. National Museum, Washington.

Material Examined: 15 ♂♂, 102 ♀♀.

Distinctive Characters. Adult: Scutum light-golden, with two dorso-central black stripes. Hind femora in females, white with black scales at tip making a ring, broken below. Tergites usually unbanded, with large lateral patches of creamy scales extending to dorsal side. Larva: Only first stage larvae have detached pecten teeth beyond seta 1. Fourth stage larva: Head setae 5 and 6 single. Lateral comb of 10-14 spines arranged in single row.

Holotype Male. Head: Vertex with narrow curved and upright scales creamy. Proboscis and palps dark scaled. Palps longer than proboscis without labella by about length of terminal segment. Thorax: Integument black. Scutum clothed with light-golden scales becoming paler around bare area. Posterior pronotum with narrow curved creamy scales. Pleura with patches of broad creamy scales and bristles. No lower mesepimeral bristles. Wings dark scaled; wing length: 4.6 mm. Knob of halteres dark with white scales. Legs: Fore and mid femora black anteriorly, pale posteriorly, unmottled. Hind femora white on basal three-quarters, black dorsally with dark dorsal line on apical half. Tibiae and tarsi black with dull violet reflections. Fore and mid claws toothed; hind claws simple. Abdomen: Tergites black scaled with violet reflections; basal lateral patches large, creamy. Sternites pale scaled with apical black bands and some black scales medially. Terminalia (Fig. 3, a, b): Coxite with short setae tergally and a few long setae laterally and apically. Sternally coxite with scales and long and medium setae. Basal and apical lobes small. Basal lobe with large patch of short, fine setae and one long seta near tergal edge. Apical lobe pointed, with one long curved, flattened seta and a few shorter ones at base. Style widening in middle; on apical third more slender and with four small setae; appendage long. Harpago long, with pilose subbasal thumb on inner side, bearing terminal seta about as long as thumb. Appendage with curved pointed tip and fimbriated distal margin. Paraproct with single tooth. Lobes of IXth tergite with 7-8 stout setae.

Paratype Males. The series of ten paratype males does not show much variation. Wing length varies from 3.4 mm. to 4.3 mm. Sternites in some specimens have more black scales medially and these may join the apical black band forming triangle.

Allotype Female. This differs from the holotype male as follows: Palps about one-fifth of proboscis with labella. Four lower mesepimeral bristles. Wing length: 5.0 mm. Upper fork cell is less than twice its stem. Hind femora white with black scales dorsally and laterally on distal quarter and forming a dorsal line for three-quarters of length. All hind claws except one toothed. First tergite with some white scales; second to sixth with line of pale scales at base and large lateral triangular spots of creamy scales. Seventh tergite mostly pale scaled. Sternites white scaled, becoming creamy towards apical border.

Paratype Females. The series of ten paratype females does not show much variation. The number of lower mesepimeral bristles varies from two to five. Wing length from 3.3 mm. to 5.0 mm. On the hind femora the area covered by dark scales may be reduced to a dorsal line on the distal half, broadening toward the tip. Hind claws in

some specimens all simple, in others from one to three claws may be toothed. Most specimens have no pale scales at base of tergites. Sternites may have scattered black scales or an inconspicuous apical black band.

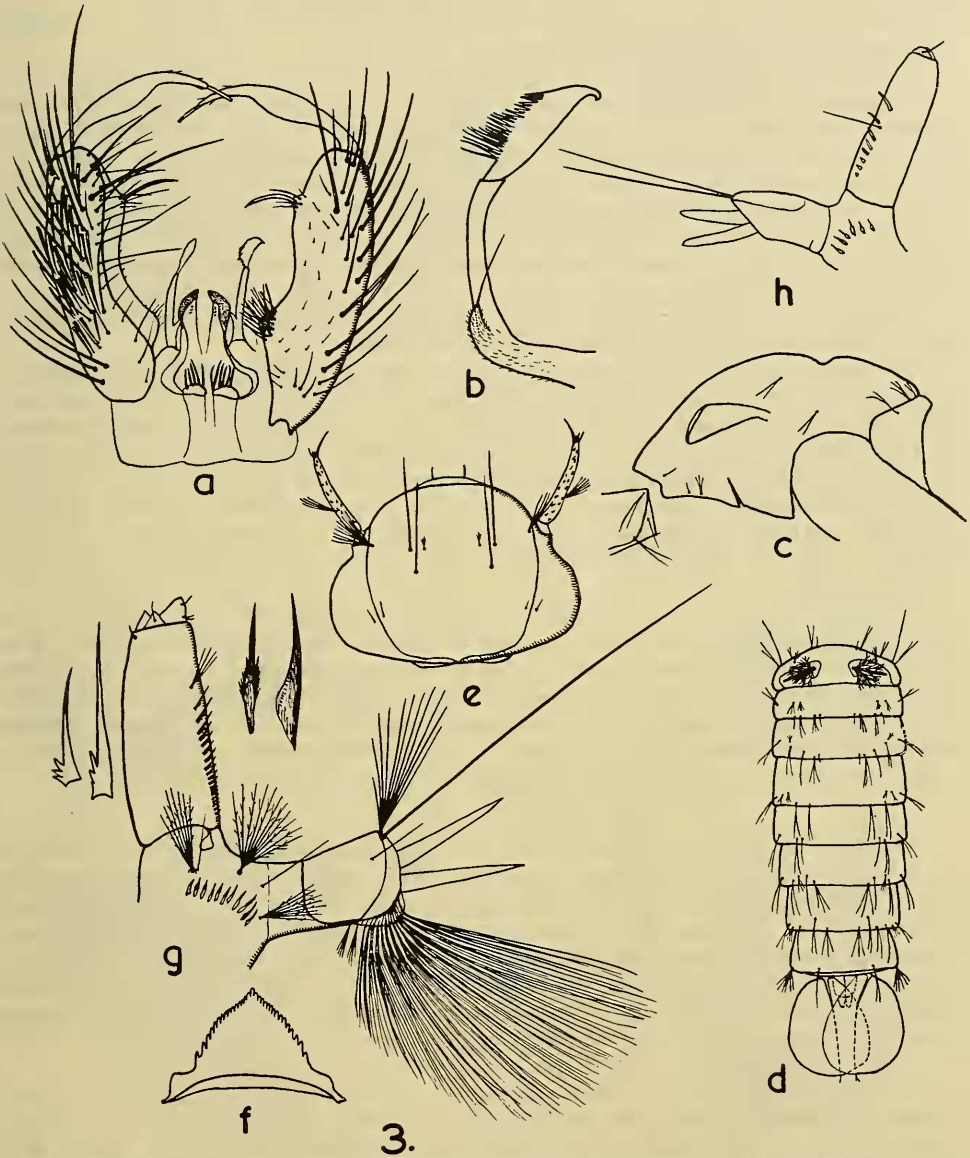


Fig. 3. *Aedes imperfectus*, n. sp. a, b, ♂ terminalia: a, left coxite sternal aspect, right tergal aspect; b, harpago; c, d, pupa: c, cephalothorax and metanotum; d, abdomen; e, f, g, IVth stage larva: e, head; f, mentum; g, terminal segments; h, 1st stage larva: terminal segments.

Larva: Fourth stage (Fig. 3, e, f, g): Head broad, seta 4, small, 2-6 branched, 5, 6 and 8, single; 7, 4-10 branched; 9, 2-3 branched. Antenna short, about half length of head; seta 1, 4-7 branched. Mentum with 14-15 lateral teeth on each side. Thorax: Setae 1, 2, 4, 5 and 6 single; 3 single or 2 branched; 7, 3 branched. Abdomen. VIIIth segment: lateral comb of 10-14 spines; seta 1, 5-8 branched; 2 and 4, single; 3, 9-12 branched; 5, 6-8 branched. Siphon short and stout, index from 1.9 to 2.3,

some specimens all simple, in others from one to three claws may be toothed. Most specimens have no pale scales at base of tergites. Sternites may have scattered black scales or an inconspicuous apical black band.

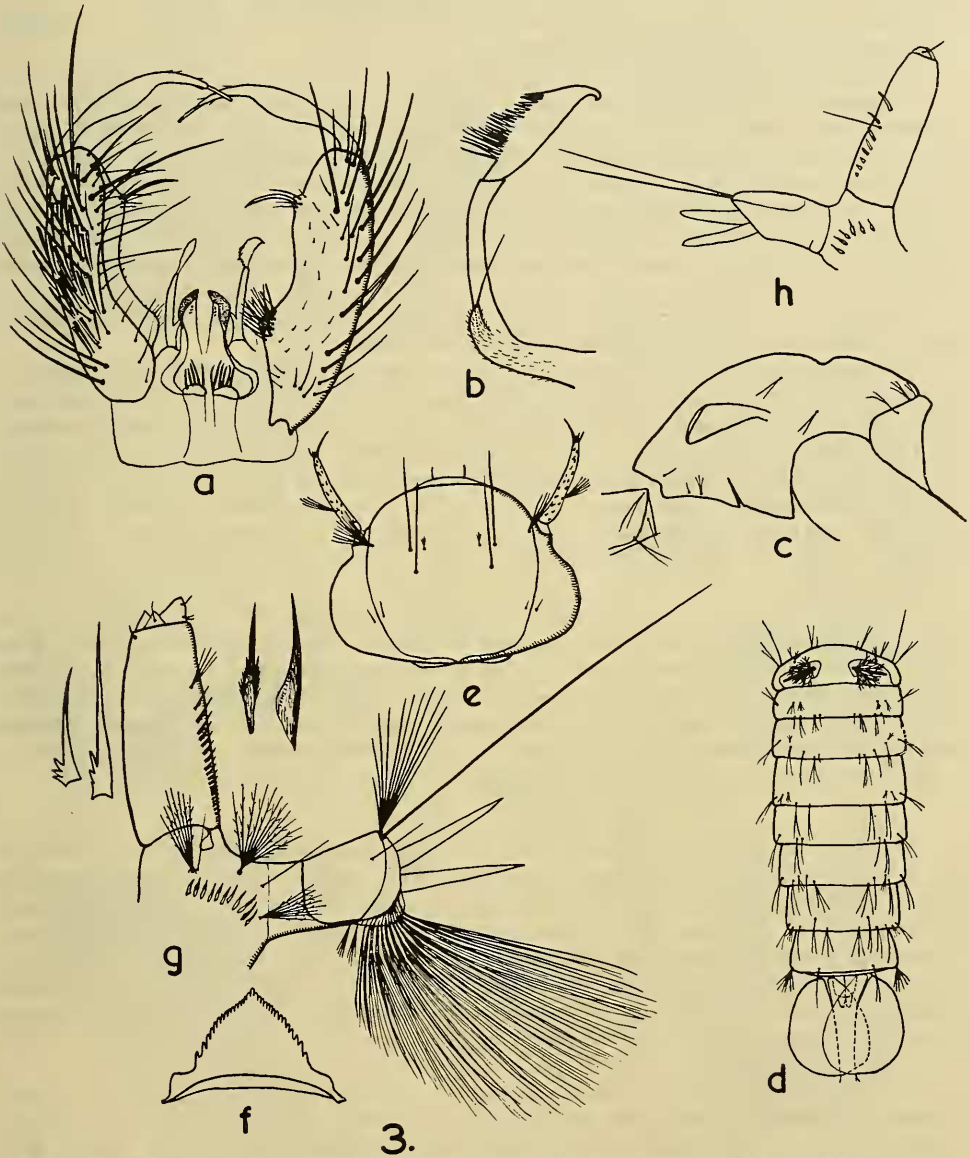


Fig. 3. *Aedes imperfectus*, n. sp. a, b, ♂ terminalia: a, left coxite sternal aspect, right tergal aspect; b, harpago; c, d, pupa: c, cephalothorax and metanotum; d, abdomen; e, f, g, IVth stage larva: e, head; f, mentum; g, terminal segments; h, 1st stage larva: terminal segments.

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mean 2.1. Seta 1, arising two-thirds of length from base of siphon, 3-5 branched; pecten of 18-24 spines; no detached teeth beyond siphonal seta 1. Anal segment: Saddle almost complete ring; seta 1, single; 2, 8-12 branched; 3, single; 4 (ventral brush) of 14-16 tufts. Anal papillae longer than saddle, narrow, pointed.

First Stage Larva (Fig. 3, e, f, g): Siphonal seta 1, single; pecten of 7-8 spines, two detached teeth beyond siphonal seta 1.

Pupa: Details shown in Figure 3, c, d.

Biology: This species breeds in partly shaded ground pools filled, usually, by flood waters. Small numbers of adults can be collected at any time from September to April, but peaks of abundance are reached during periods following flooding of rivers in the area. This may occur at different times of the year. Thus in the Woori Yallock area, in 1957, the specimens were abundant during the second half of November, but in 1961 it was rarely found during the spring and summer and reached its peak in March (1962). In Victoria it was found associated with *Aë. alboannulatus* (Macquart) and *Aë. rubrithorax* (Macquart).

Habits: It is a very vicious day-biting mosquito near breeding grounds during its peak period. It has been recorded attacking man and cows.

Distribution: It is distributed in eastern Australia from South Queensland to Victoria. Specimens have been examined from the following localities: Queensland: Pine Creek, Mt. Pleasant, April, 1955, M. C. Coy. New South Wales: Merriumbene, 10.III.55, 21.III.55, 22.III.55, A. L. Dyce and E. O'Sullivan, 14.IV.55, R. Lewis; Colo Vale, 27.2.56, K. O'Gower. Victoria: Cabbage Tree Creek, 19.I.56, 22.II.56, 12.IV.61, 20.III.62, N. V. Dobrotworsky; Leongatha, 26.X.53, G. W. Douglas; Woori Yallock, 14.XI.57, 21.XI.57, 15.IX.58 (larvae only), 9.XII.60, 26.III.61, N. V. Dobrotworsky; Watson's Creek, 24.X.53, A. Neboiss; Lyonville, 9.III.55; Beaufort, 3.X.59 (larva), N. V. Dobrotworsky.

Discussion: Adults of *Aë. imperfectus* closely resemble *Aë. burpengaryensis*, but lack the intense violet reflections which are so characteristic of the latter species. Also, in *Aë. imperfectus* the ring of dark scales at the tip of the hind femur is incomplete, being interrupted ventrally by pale scales. On the characters of the male terminalia, the species should be placed in the Burpengaryensis Section of the subgenus *Ochlerotatus*. The fourth stage larva, it is true, has no detached pecten teeth beyond siphonal seta 1, but such detached teeth are present in the first stage larva.

AËDES (FINLAYA) SUBBASALIS, n. sp.

Types: The holotype, allotype and 20 paratypes were bred from larvae collected by A. L. Dyce 28.2.62 at Ginninderra Falls, New South Wales. All have their associated larval and pupal skins. The holotype male, allotype female, five paratype males and five paratype females are in the collections of the C.S.I.R.O., Division of Entomology, Canberra. One paratype male and one paratype female are in each of the following collections: National Museum, Melbourne; School of Public Health and Tropical Medicine, Sydney; University of Queensland, Brisbane; British Museum (Natural History), London; U.S. National Museum, Washington.

Material Examined: 29 ♂♂, 54 ♀♀.

Distinctive Characters. Adult: Scutum bronze scaled with admixture of white scales. Prescutellar area with narrow curved scales. Tibiae black scaled with sub-basal pale ring which may be incomplete. Tarsi banded. Sternites in female with apical black bands. Larva: Head setae 4, 5 and 6 with their bases on almost a straight line. Prothoracic seta 4, single; 5, 2 branched. By these traits larvae of *Aë. subbasalis* may be distinguished from all other members of *alboannulatus* group except *Aë. rupestris* Dobrot.

Holotype Male. Head: Narrow curved white scales on vertex forming a broad triangular patch. Upright forked scales black. Palpi slightly shorter than proboscis without labella, black scaled with white patches at base of segments 2-5. Proboscis black. Thorax: Integument dark, almost black. Scutum clothed mostly with bronze scales with golden reflections; white scales on front and lateral margins, around bare area and forming two short dorso-central lines. Scutellum with narrow white scales.

mean 2.1. Seta 1, arising two-thirds of length from base of siphon, 3-5 branched; pecten of 18-24 spines; no detached teeth beyond siphonal seta 1. Anal segment: Saddle almost complete ring; seta 1, single; 2, 8-12 branched; 3, single; 4 (ventral brush) of 14-16 tufts. Anal papillae longer than saddle, narrow, pointed.

First Stage Larva (Fig. 3, e, f, g): Siphonal seta 1, single; pecten of 7-8 spines, two detached teeth beyond siphonal seta 1.

Pupa: Details shown in Figure 3, c, d.

Biology: This species breeds in partly shaded ground pools filled, usually, by flood waters. Small numbers of adults can be collected at any time from September to April, but peaks of abundance are reached during periods following flooding of rivers in the area. This may occur at different times of the year. Thus in the Woori Yallock area, in 1957, the specimens were abundant during the second half of November, but in 1961 it was rarely found during the spring and summer and reached its peak in March (1962). In Victoria it was found associated with *Aë. alboannulatus* (Macquart) and *Aë. rubrithorax* (Macquart).

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Holotype Male. Head: Narrow curved white scales on vertex forming a broad triangular patch. Upright forked scales black. Palpi slightly shorter than proboscis without labella, black scaled with white patches at base of segments 2-5. Proboscis black. Thorax: Integument dark, almost black. Scutum clothed mostly with bronze scales with golden reflections; white scales on front and lateral margins, around bare area and forming two short dorso-central lines. Scutellum with narrow white scales.

Posterior pronotum with broad white scales below, narrow curved black scales in middle and narrow curved white scales above. Pleura with usual patches of broad white scales and pale bristles. Wing length 3.7 mm. Knob of halteres white scaled. Legs:

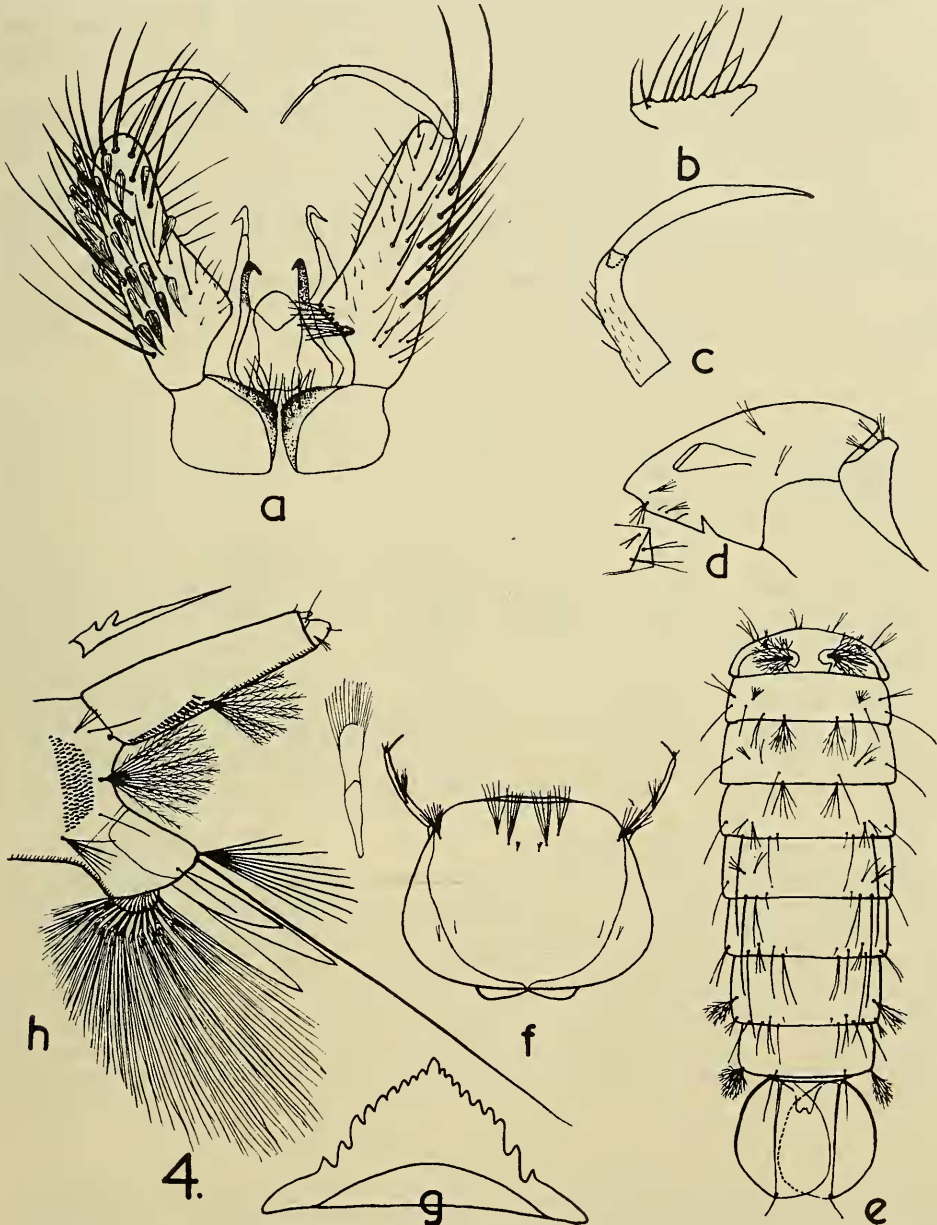


Fig. 4. *Aedes subbasalis*, n. sp. a, b, c, ♂ terminalia: a, left coxite sternal aspect, right tergal aspect; b, basal lobe of coxite; c, harpago; d, e, pupa: d, cephalothorax and metanotum; e, abdomen; f, g, h, larva: f, head; g, mentum; h, terminal segments.

Fore and mid femora black, mottled with white scales; fore tarsi with two basal bands, mid tarsi with three. Hind femora white with black mottling on distal half. All tibiae black scaled with incomplete subbasal pale ring. Hind tarsi with four white basal bands. Knee spots white. Abdomen: Tergites black scaled with white basal

Posterior pronotum with broad white scales below, narrow curved black scales in middle and narrow curved white scales above. Pleura with usual patches of broad white scales and pale bristles. Wing length 3.7 mm. Knob of halteres white scaled. Legs:

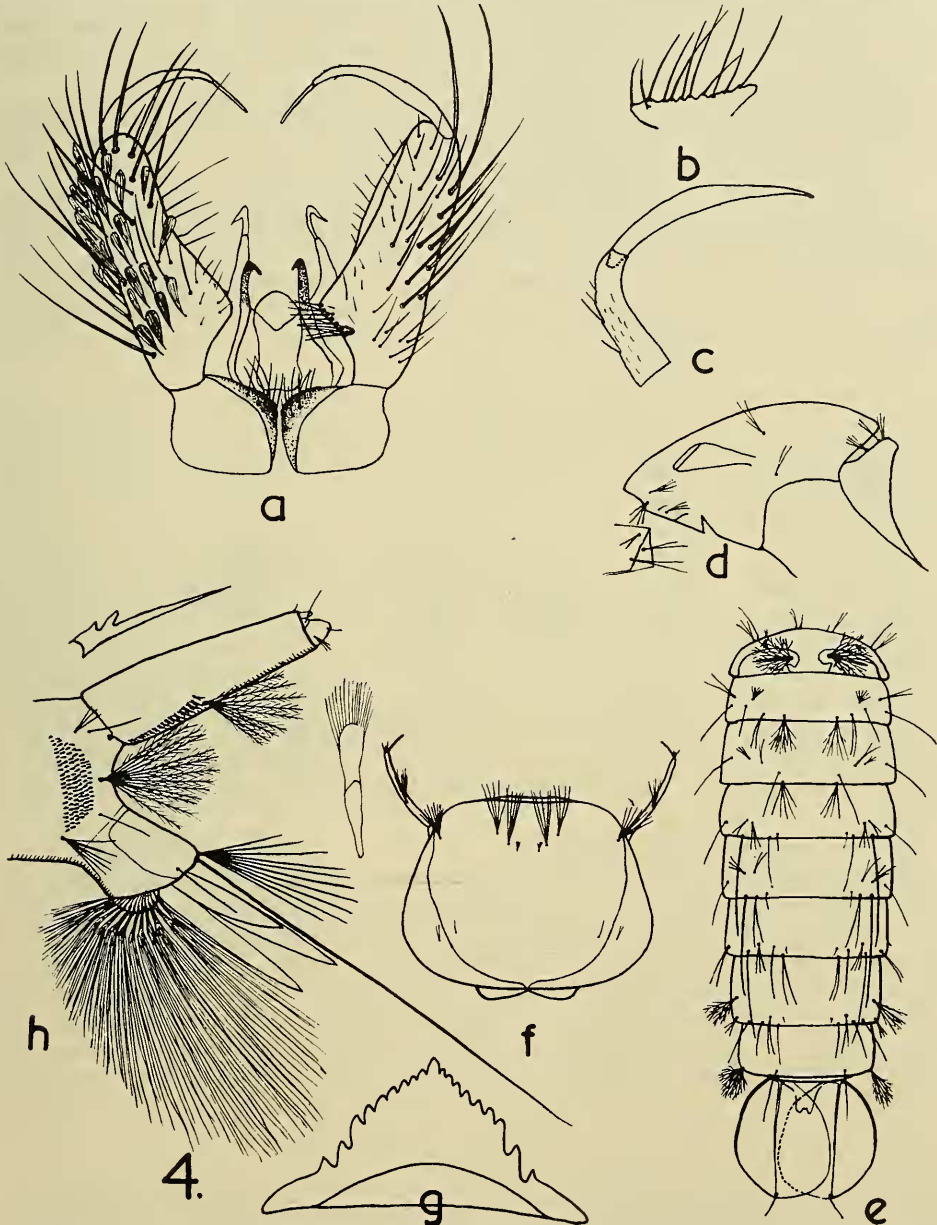


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Fore and mid femora black, mottled with white scales; fore tarsi with two basal bands, mid tarsi with three. Hind femora white with black mottling on distal half. All tibiae black scaled with incomplete subbasal pale ring. Hind tarsi with four white basal bands. Knee spots white. Abdomen: Tergites black scaled with white basal

bands, except on the first. Sternites black scaled with white lateral basal patches. Terminalia (Fig. 4, *a*, *b*, *c*): Coxite black scaled with some white scales basally, and long and short setae laterally. Basal lobe of coxite narrow, transverse, with row of about 10 long setae along edge. Style about half length of coxite narrow, curved, with 2-3 preapical setae; terminal appendage straight and long. Harpago stout, with fine setae at base; appendage longer than harpago. Paraproct with single tooth. Ninth tergite with large lobe bearing 4 setae.

Paratype Males. The series of 10 paratype males does not show much variation. The scutal scales in some specimens with golden reflections. Length of wings varies from 3.3 mm. to 3.7 mm. Lobes of IXth tergite with 3-8 setae.

Allotype Female. This differs from the holotype as follows: Palps about one-fifth length of proboscis, with white scales at base of second segment and at base and apex of third. Torus and first flagellar segment of antenna with white scales. First tergite with a few white scales, second with basal band not joining lateral spots, third-seventh with constricted laterally bands. Sternites white scaled with apical bands joined to elongate median patch of black scales. Wing length: 4.0 mm. Upper fork cell about twice the length of its stem.

Paratype Females. The main variations in a series of 10 females are: The triangular pale scaled area on the vertex in some specimens is reduced to a narrow median patch. The scutal scales may be golden. The dorso-central white lines on the scutum are sometimes reduced to two patches. The intensity of mottling of femora is variable. The basal bands on the tergites, in some specimens, are straight, in others all are constricted laterally. Wing length: 3.0 mm. to 4.0 mm.

Larva (Fig. 4, *f*, *g*, *h*): Head only slightly wider than long. Seta 4 small, 3-5 branched; 5 and 6, 5-6 branched; 7, 6-9 branched; 8, single; 9, 2-3 branched. Setae 4, 5 and 6 with bases almost in a straight line. Mentum with 9-11 lateral teeth on each side. Prothoracic setae: Seta 1, single or 2 branched; 7, 3 branched. Abdomen: VIIIth segment: seta 1, 2-5 branched; 2 and 4, single; 3, 9-12 branched; 5, 4-6 branched. Comb of more than one hundred scales. Siphon index from 3.0 to 3.6, mean 3.3; seta 1, 7-11 branched; pecten of 17-21 spines. Anal segment: saddle covering about one-third of the segment. Seta 1, single, rarely 2 branched; 2, 10-12 branched; 3, single; 4 (ventral brush) of 14-16 tufts. Anal papillae long, slightly less than twice length of saddle.

Pupa: Details shown in Figure 4, *d*, *e*.

Biology: The breeding places of *Aë. subbasalis* are rock pools in river and creek beds. Usually they are exposed to sun, but may be partly shaded. The water may be light-brown coloured or clear, with decayed leaves and debris on the bottom.

In Queensland it was found in association with larvae of *C. halifaxii* Theob., *Aë. notoscriptus* (Skuse) and *A. annulipes* Walker. In New South Wales with *Aë. notoscriptus*, *Aë. alboannulatus*, *Aë. rubrithorax*, *C. p. australicus* Dobr. and Drumm, and *A. annulipes*. In some pools in New South Wales it was the dominant species. In Victoria where it is less common it was found breeding mostly in association with *Aë. rupestris*.

Habits: *Aë. subbasalis* is a day-biting mosquito, often attacking man in bright sunlight.

Distribution: *Aë. subbasalis* is distributed in eastern Australia and has been collected from Kuranda (N.W. of Cairns) in Queensland to the Cann River-Buchan area in Victoria. Specimens have been examined from Queensland: Kuranda, 22.VI.46, E. N. Marks; Stannary Hills, 30.X.08, T. L. Bancroft; O'Connell River, 7.X.47, J. L. Wassell; Broken River, alt. 2,000', 27.VII.56, T. E. Woodward; Koumala, 18.XI.45, B. Atherton, 11.XII.45, A. Price; Nambour, 14.VIII.45, F. A. Perkins & J. L. Wassell, 25.IV.45, J. L. Wassell; Egan's Creek nr. Crow's Nest, 21.VII.57, M. Loveday; Canungra, 13.III.55, M. J. Mackerras. New South Wales: Wallangra, 16.I.53, E. N. Marks; Bendimeer, 30.IX.50, I. M. Mackerras; Bundarra, 18.VIII.54, 31.VIII.54, 6.X.54, E. J.

bands, except on the first. Sternites black scaled with white lateral basal patches. Terminalia (Fig. 4, *a*, *b*, *c*): Coxite black scaled with some white scales basally, and long and short setae laterally. Basal lobe of coxite narrow, transverse, with row of about 10 long setae along edge. Style about half length of coxite narrow, curved, with 2-3 preapical setae; terminal appendage straight and long. Harpago stout, with fine setae at base; appendage longer than harpago. Paraproct with single tooth. Ninth tergite with large lobe bearing 4 setae.

Paratype Males. The series of 10 paratype males does not show much variation. The scutal scales in some specimens with golden reflections. Length of wings varies from 3.3 mm. to 3.7 mm. Lobes of IXth tergite with 3-8 setae.

Allotype Female. This differs from the holotype as follows: Palps about one-fifth length of proboscis, with white scales at base of second segment and at base and apex of third. Torus and first flagellar segment of antenna with white scales. First tergite with a few white scales, second with basal band not joining lateral spots, third-seventh with constricted laterally bands. Sternites white scaled with apical bands joined to elongate median patch of black scales. Wing length: 4.0 mm. Upper fork cell about twice the length of its stem.

Paratype Females. The main variations in a series of 10 females are: The triangular pale scaled area on the vertex in some specimens is reduced to a narrow median patch. The scutal scales may be golden. The dorso-central white lines on the scutum are sometimes reduced to two patches. The intensity of mottling of femora is variable. The basal bands on the tergites, in some specimens, are straight, in others all are constricted laterally. Wing length: 3.0 mm. to 4.0 mm.

Larva (Fig. 4, *f*, *g*, *h*): Head only slightly wider than long. Seta 4 small, 3-5 branched; 5 and 6, 5-6 branched; 7, 6-9 branched; 8, single; 9, 2-3 branched. Setae 4, 5 and 6 with bases almost in a straight line. Mentum with 9-11 lateral teeth on each side. Prothoracic setae: Seta 1, single or 2 branched; 7, 3 branched. Abdomen: VIIIth segment: seta 1, 2-5 branched; 2 and 4, single; 3, 9-12 branched; 5, 4-6 branched. Comb of more than one hundred scales. Siphon index from 3.0 to 3.6, mean 3.3; seta 1, 7-11 branched; pecten of 17-21 spines. Anal segment: saddle covering about one-third of the segment. Seta 1, single, rarely 2 branched; 2, 10-12 branched; 3, single; 4 (ventral brush) of 14-16 tufts. Anal papillae long, slightly less than twice length of saddle.

Pupa: Details shown in Figure 4, *d*, *e*.

Biology: The breeding places of *Aë. subbasalis* are rock pools in river and creek beds. Usually they are exposed to sun, but may be partly shaded. The water may be light-brown coloured or clear, with decayed leaves and debris on the bottom.

In Queensland it was found in association with larvae of *C. halifaxii* Theob., *Aë. notoscriptus* (Skuse) and *A. annulipes* Walker. In New South Wales with *Aë. notoscriptus*, *Aë. alboannulatus*, *Aë. rubrithorax*, *C. p. australicus* Dobr. and Drumm, and *A. annulipes*. In some pools in New South Wales it was the dominant species. In Victoria where it is less common it was found breeding mostly in association with *Aë. rupestris*.

Habits: *Aë. subbasalis* is a day-biting mosquito, often attacking man in bright sunlight.

Distribution: *Aë. subbasalis* is distributed in eastern Australia and has been collected from Kuranda (N.W. of Cairns) in Queensland to the Cann River-Buchan area in Victoria. Specimens have been examined from Queensland: Kuranda, 22.VI.46, E. N. Marks; Stannary Hills, 30.X.08, T. L. Bancroft; O'Connell River, 7.X.47, J. L. Wassell; Broken River, alt. 2,000', 27.VII.56, T. E. Woodward; Koumala, 18.XI.45, B. Atherton, 11.XII.45, A. Price; Nambour, 14.VIII.45, F. A. Perkins & J. L. Wassell, 25.IV.45, J. L. Wassell; Egan's Creek nr. Crow's Nest, 21.VII.57, M. Loveday; Canungra, 13.III.55, M. J. Mackerras. New South Wales: Wallangra, 16.I.53, E. N. Marks; Bendimeer, 30.IX.50, I. M. Mackerras; Bundarra, 18.VIII.54, 31.VIII.54, 6.X.54, E. J.

Waterhouse; Gata River, Armidale, 20.V.49; Ginninderra Creek, Sept. 1952, R. Mykytowycz, 24.IV.58, N. V. Dobrotworsky, 28.II.62, A. L. Dyce. Victoria: Tubbot, 17.II.56; Little River, Gippsland, 17.II.56; Weeragua, 24.I.62, N. V. Dobrotworsky.

Discussion: *Aë. subbasalis*, *Aë. milsoni* and *Aë. rupestris* have apical black bands on the sternites. *Aë. milsoni* has a prescutellar patch of broad scales, but in the other two species there are only narrow, curved scales.

The larvae of these three species are very similar, but the setae of the head and prothorax indicate that *subbasalis* is more closely related to *rupestris* than to *milsoni*. The bases of head setae 4, 5 and 6 in *subbasalis* and *rupestris* are on a straight line; prothoracic seta 5 is 2 branched in both. The bases of these head setae in *milsoni* are arranged to form the apices of a triangle and prothoracic seta 5 is single.

In Victoria where *Aë. subbasalis* breeds together with *Aë. rupestris* no intermediate forms have been collected and because of this *Aë. subbasalis* should be regarded as a species.

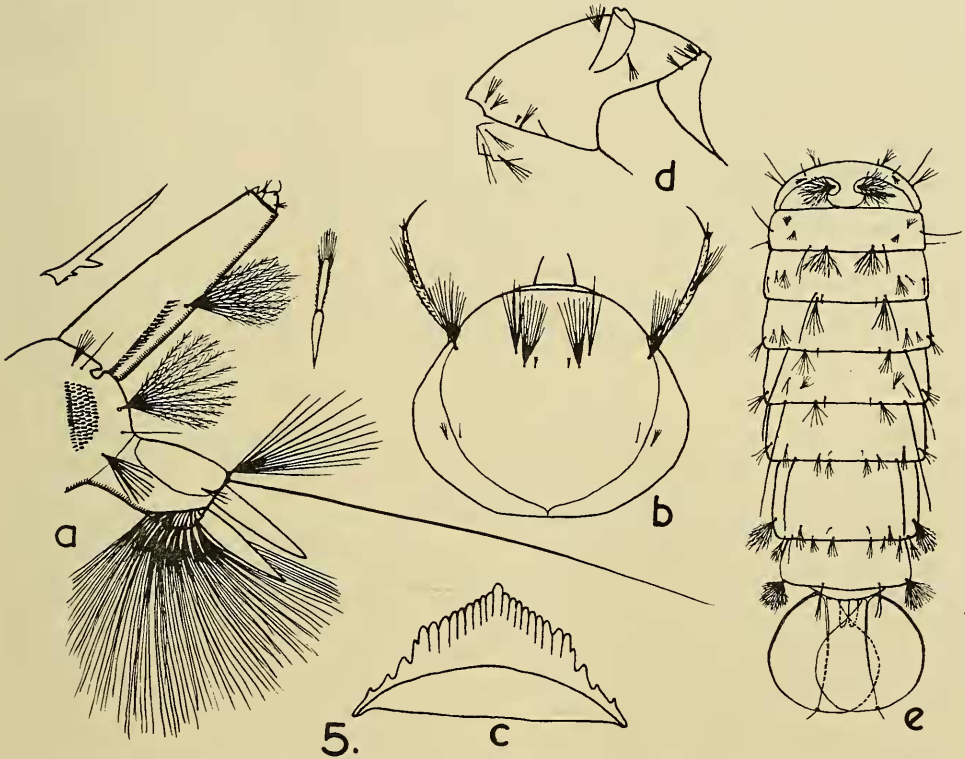


Fig. 5. *Aedes milsoni* (Taylor). a, b, c, larva: a, terminal segments; b, head; c, mentum; d, e, pupa: d, cephalothorax and metanotum; e, abdomen.

AÈDES (FINLAYA) MILSONI (Taylor).

Culicada milsoni Taylor, 1915, PROC. LINN. SOC. N.S.W., 40: 179.

Description of Larva (Fig. 5): Head only slightly wider than long. Seta 4, small, 5 branched; 5, 7-10 branched; 6, 3-5 branched, usually with one branch much thicker than others; 7, 12-15 branched; 8, single; 9, 4-5 branched. Mentum with 11-13 lateral teeth on each side. Antenna short, about half length of head; seta 1, 5-7 branched. Prothoracic setae: Seta 1, 2 branched; 2, 5 and 6, single; 3, 7-12 branched; 4 and 7, 3 branched. Abdomen: VIIIth segment: Seta 1, 5-6 branched; 2 and 4, single; 3, 11-13 branched; 5, 6-7 branched. Siphon index 3.0-3.3; pecten of 25-26 spines; seta 1, 9-10 branched. Anal segment: seta 1, 3 branched; 2, 12-13 branched; 3, single; 4 (ventral brush) of 14 tufts.

Waterhouse; Gata River, Armidale, 20.V.49; Ginninderra Creek, Sept. 1952, R. Mykytowycz, 24.IV.58, N. V. Dobrotworsky, 28.II.62, A. L. Dyce. Victoria: Tubbot, 17.II.56; Little River, Gippsland, 17.II.56; Weeragua, 24.I.62, N. V. Dobrotworsky.

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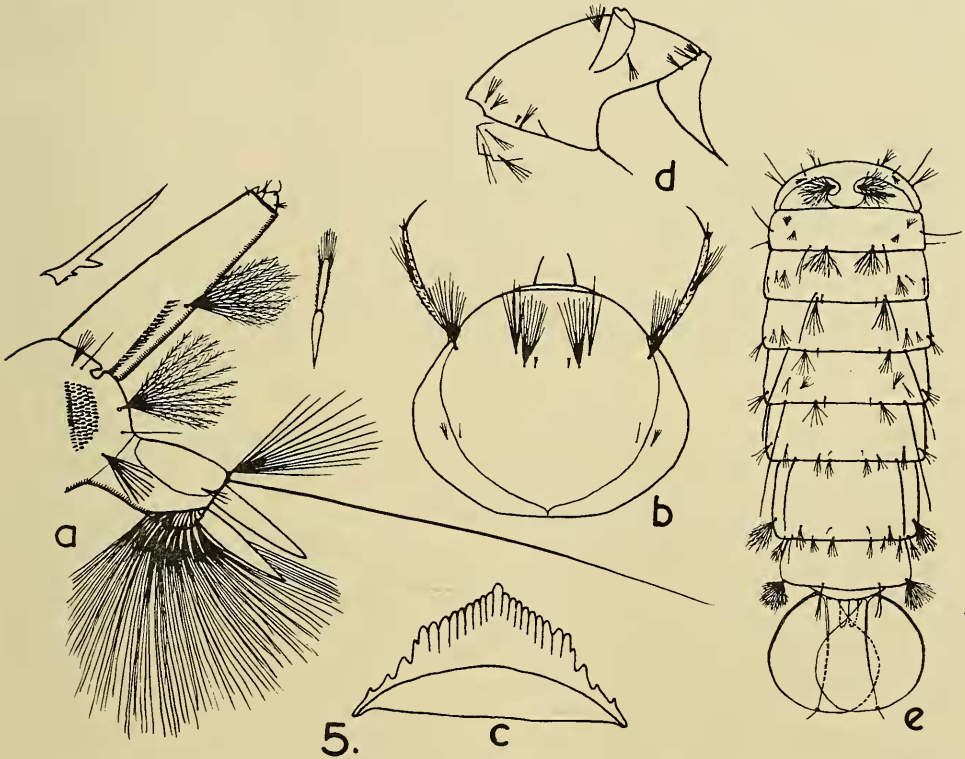


Fig. 5. *Aedes milsoni* (Taylor). a, b, c, larva: a, terminal segments; b, head; c, mentum; d, e, pupa: d, cephalothorax and metanotum; e, abdomen.

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Pupa: Details shown in Figure 5, *d*, *e*.

The larva has been described and the pupa figured from larvae and pupae collected at Salisbury, Queensland, 15.X.46, L. Angus.

Biology: In Queensland it breeds in partly shaded ground and rock pools, with leaves on bottom. The water was clear or, in some pools, discoloured.

Distribution: It is a northern species recorded in Queensland and New South Wales. In Victoria three females have been collected at Maryborough, I.X.60, N. V. Dobrotworsky.

Acknowledgements.

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